

## **SUGGESTIONS FOR THE PACKING AND SHIPPING OF PLANT MATERIAL**

1. **Introduction** - This circular has been prepared for the guidance of plant material importers. Although the information contained herein is based on many years of experience in clearing plant materials, this Agency disclaims all responsibility for any adverse results.

2. **Freedom From Pest and Soil** - Only healthy vigorous plants free from plant pests should be shipped. All plant materials must be free of all traces of soil.

3. **Packing Materials** - After removal of the growing media, plants may be packed for transit in any of the following approved packing materials provided the materials are free from sand, soil, or earth and have not been previously used as packing or growing media.

*Baked or expanded clay pellets*  
*Buckwheat hulls*  
*Coconut fiber*  
*Excelsior*  
*Exfoliated vermiculite*  
*Ground Cork*  
*Ground Peat*  
*Ground Rubber*  
*Osmunda fiber*  
*Polymer stabilized cellulose*

*Paper*  
*Perlite*  
*Quarry Gravel*  
*Rock wool*  
*Sawdust*  
*Shavings (wood or cork)*  
*Sphagnum moss*  
*Vermiculite*  
*Volcanic rock*

Ground peat (*or peat moss*) and sphagnum moss are the most commonly used packing materials.

4. **Shipping Season** - Plants will best survive soil removal and other transit hazards when shipped during their dormant season. For most greenhouse and tropical plants not normally having a dormant season, it is advisable to ship cuttings rather than plants. Importers of tender plants should bear in mind the risk of having plants arrive at destination during a period of extreme temperature.

5. **Shipping Containers** - Plant materials should be shipped in strong containers which will withstand the many abuses they may receive while in transit. Flimsy containers often result in missing or damaged plants.

**6. *Packaging (General)*** - Plants require adequate ventilation especially when in transit for extended periods. Therefore, plant material should not be entirely enclosed in air tight containers.

If plastic or polyethylene bags or wrappers are used, they should cover only the roots and crowns leaving the tops of the plants exposed to the air. Such bags or wrappers should be perforated (*approximately 3/16" holes*) to allow for penetration of fumigants in the event treatment is required. Sufficient packing material should be used to properly protect the roots from drying and to prevent the shifting of plants within the container during transit. When shipping in large containers, cleats should be used to prevent shifting and mechanical damage to the plants.

**7. *Means of Importation*** - The importer should include specific shipping instructions when ordering plants. Surface mail should not be used for perishable materials since these materials will not survive long transit periods. Air parcel post is usually the most convenient and economical means of transportation for small quantities of plant materials.

**8. *Trees and Shrubs*** - The plants should be packed with the roots positioned towards the ends of the containers. The roots should be covered with damp packing material or they may be balled and burlaped. Each layer of plants should be securely held in place by cleats with a layer of excelsior between the cleats to prevent mechanical damage. With small quantities of plants, the roots should be wrapped in moisture-proof paper or polyethylene. Add sufficient damp packing material to maintain an adequate moisture level and wrap the plants with burlap into a bundle or enclose the plants in a sturdy carton.

**9. *Herbaceous Perennials*** - Dormant perennials (*with no top growth*) such as astilbe, dicentra, phlox, and peonies may be packed in slightly damp ground peat moss. Perennials with active top growth such as chrysanthemums and delphiniums must be packed so that the roots are protected from drying but, at the same time, the damp packing materials should not come in contact with the foliage. Adequate ventilation should be provided.

**10. *Cacti and Succulents*** - These should be allowed to dry before shipment. It is suggested that these plants be packed with excelsior or newspaper to absorb excess moisture. This method of packing will also prevent shifting and injury from spine punctures of an adjacent plant.

**11. *Bulbs, Corms, and Tubers*** - Properly cured bulbs and corms may be packed without any packing material. Tubers and fleshy roots should be dry before being packed in dry peat moss, wood shavings, or excelsior. Adequate ventilation is necessary.

12. *Orchids* - Orchids which are well cured by air drying may be packed between layers of dry excelsior, newspaper, or shredded paper. Orchids may also be shipped without any packing materials if packed firmly to prevent shifting during transit. Adequate ventilation should be provided in all cases. Greenhouse or established orchids growing in osmunda fiber or other approved soil-free material should have the entire plant surrounded with a layer of excelsior and the plants should be tied or otherwise secured to prevent shifting.

13. *Scions, Budwood, or Cuttings* - Scions or budwood of rose and fruit and nut plants should be enclosed in three or four layers of damp newspaper with the ends of paper folded over. The bundle should then be enclosed in one sheet of polyethylene or plastic film wrapping material to prevent moisture loss. No peat moss or sphagnum should be used. The bundles should be enclosed in a suitable container or wrapped in corrugated cardboard for shipment. Cuttings such as *Dracaena*, *Diffenbachia*, *Philodendron*, etc. should be wrapped in dry newspaper and packaged to provide for some ventilation during transit.

14. *Seeds* - Seeds should be free of all pulp, husks, or other extraneous material and be dried to remove excess moisture before packing in a sturdy cloth bag or other container. Polyethylene liners may be used to prevent moisture absorption during transit.